

OCEAN GALES AND STORMS JUNE, 1925

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
North Atlantic Ocean													
Bay State, Br. S. S.	Belfast	New York	55 20N.	8 20W.	May 30	Mid. 30th.	June 5.	Inches 28.99	W	W	WSW	12.	Steady W.
Baron Wemyss, Br. S. S.	Spain	Newfound-land.	45 44N.	32 00W.	June 2.	6 a., 2d.	4th.	29.90	SW	SW., 7	WNW	WNW., 10	W-SSW.
Caronia, Br. S. S.	Queenstown.	New York	45 44N.	35 26W.	2d.	1 a., 3d.	3d.	29.67	WSW	WSW., 8	NW	10.	WSW-W.
Montrolite, Br. S. S.	Moss, Norway.	do.	56 00N.	24 40W.	2d.	4 p., 4th.	5th.	29.20	S	SW., 10	SW	SW., 10.	SSW-WSW.
Montpellier, Am. S. S.	Hamburg	Philadelphia	46 50N.	29 40W.	5th.	Noon 6th.	6th.	29.09	SSW	SSW., 8	SW	SSW., 8.	SSW-S-SW.
Brush, Am. S. S.	Rotterdam	New Orleans	37 45N.	32 50W.	6th.	4 a., 8th.	9th.	29.69	SW	SW., 8	W	SW., 8	Steady.
Hessen, Ger. S. S.	Colon	Hamburg	45 30N.	31 47W.	8th.	10 a., 8th.	9th.	29.42	WSW	WSW., 10	SW	SW., 10	
West Modus, Am. S. S.	Dundee	Houston	54 31N.	18 44W.	8th.	3 a., 9th.	10th.	29.72	SE	SSE., 3	SW	8.	SSE-SSW.
Hatteras, Am. S. S.	New York	England	40 30N.	57 35W.	16th.	6 p., 16th.	17th.	29.35	S	SW., 9	NW	SW., 10.	SW-NW.
Andalusier, Belg. S. S.	do.	Antwerp	41 30N.	56 40W.	16th.	1 a., 17th.	18th.	29.15	SW	SW., 12	WNW	SW., 12	
Baron Sempill, Br. S. S.	Fowey	Philadelphia	43 32N.	55 21W.	19th.	8 a., 19th.	19th.	29.33	SW	SW., 8	W	SW., 9	SW-W.
Carlier, Belg. S. S.	Antwerp	New York	41 55N.	52 45W.	23d.	10 p., 23d.	24th.	29.94	SSW	SSW., 11	WSW	SSW., 11	SSW-WSW.
Sixola, Am. S. S.	New York	Colombia	37 15N.	74 04W.	25th.	6 a., 25th.	25th.	29.88	SSW	SSW., 5	SSW	8.	Steady.
Kongosan Maru, Jap. S. S.	Limerick	Norfolk	39 25N.	63 31W.	25th.	3 a., 26th.	26th.	30.08	SSW	SSW., 8	SSW	SSW., 8	Steady.
Eastern Victor, Am. S. S.	Antwerp	Philadelphia	46 31N.	31 48W.	30th.	10 a., 30th.	July 1.	30.12	WSW	W., 6.	WNW	NW., 8.	W-NW.
North Pacific Ocean													
Walter A. Luckenbach, Am. S. S.	San Pedro	Balboa	13 30N.	94 30W.	2d.	4 p., 3d.	4th.	29.53	E	E., 7	SSW	E., 7	ENE-ESE.
Margaret Coughlan, Br. S. S.	Port Alberni	do.	13 30N.	93 30W.	4th.	8 p., 4th.	5th.	29.50	N.by E.	N. by E., 8	S. by W.	SW., 9	N. N. by E.
W. H. Telford, Am. S. S.	San Pedro	do.	14 00N.	94 30W.	5th.	5 a., 5th.	5th.	29.57	NW	NW., 7	W	W., 9	NW-W.
China Arrow, Am. S. S.	San Francisco	Taku	36 50N.	165 30W.	7th.	2 a., 8th.	8th.	29.66	SE	SSE., 8	W	SSE., 8	SSE-SW-W.
Bolton Castle, Br. S. S.	Panama	Yokohama	29 50N.	156 50E.	9th.	11 a., 9th.	10th.	29.64	S	SW., 10	E	SW., 10.	E-S-SW.
Makaweli, Am. S. S.	Hawaii	San Francisco	36 55N.	125 40W.	11th.	9 p., 11th.	12th.	29.94	NW	NW., 8	NW	NW., 8	Steady.
Enterprise, Am. S. S.	do.	do.	37 26N.	123 48W.	13th.	3 p., 13th.	13th.	29.82	NW	NW., 9	NW	NW., 9	Steady.
Kaga Maru, Jap. S. S.	Yokohama	Victoria	49 52N.	167 36E.	22d.	4 p., 22d.	25th.	29.40	SSE	SSE., 8	SSE	SSE., 8	Steady.
Canadian Inventor, Br. S. S.	Balboa	do.	39 08N.	124 05W.	26th.	4 p., 27th.	28th.	29.97	NW	NW., 8	NNW	NW., 8	Steady.
Canadian Prospector Br. S. S.	Vancouver	Montreal	15 00N.	95 34W.	28th.	4 p., 28th.	29th.	29.80	ENE	NE. by N, 7.	N	N., 8	ENE-NE-N.
President Grant, Am. S. S.	Seattle	Yokohama	43 17N.	155 10E.	29th.	8 p., 29th.	30th.	28.85	ESE	SE. by S.	SW	SW., 9	SE. by S-SW.
Broad Arrow, Am. S. S.	Hongkong	San Pedro	35 35N.	141 35E.	29th.	6 p., 29th.	29th.	29.60	SE	ENE., 7	ESE	NE., 8	SE-NE-E.
South Pacific Ocean													
Makura, Br. S. S.	Sydney	Wellington	35 00S.	155 01E.	18th.	4 a., 19th.	20th.	30.51	E	E., 7	ESE	E., 8	E-ESE.
Do.	Wellington	Raratonga	39 20S.	178 45E.	24th.	8 a., 24th.	25th.	29.86	N	N., 8	NE	NNE., 9	N-NNE.
Indian Ocean													
Defender, Br. S. S.	Mauritius	Calcutta	17 36N.	87 10E.	27th.	4 p., 27th.	27th.	29.51	SW	SW., 6	SW	WSW., 8	W-SW.

¹ Highest force of wind on June 4-5.

NORTH PACIFIC OCEAN

By F. G. TINGLEY

The weather of the North Pacific Ocean exhibited no unusual features during June so far as disclosed by a somewhat general survey of conditions. As may be expected at this season, pressure distribution shows relatively little variation from day to day and gales are infrequent. The month under consideration was typical in these respects. Pressure gradients for the most part were moderate and the highest wind force reported by any vessel was 10. Numerous reports of fog were received from the western section of the northern steamship routes, but few from other parts of the ocean.

The anticyclone which normally occupies the region northeast of the Hawaiian Islands was well developed throughout the month, except from the 9th to 11th, when there was an encroachment of low pressure from the northwest. During this period the lowest pressure of the month was recorded at Dutch Harbor, 29.22 inches. During the last half of June pressure was also consistently high in middle latitudes of the central part of the ocean. On the 18th and 19th vessels north and northwest of Midway Island reported readings as high as 30.52 inches. This high pressure appeared to advance from the region of Kamchatka and its eastward movement caused a reinforcement of the semipermanent area north of Hawaii, where readings of 30.40 inches or more were reported on

several days. The crest of high pressure in this region in June is normally a little more than 30.25 inches.

Pressure data for the several island stations in the eastern North Pacific, as well as for a few stations on the American coast, are given in the following table:

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
Dutch Harbor ¹	29.86	-0.13	30.40	22d.	29.22	10th.
St. Paul ¹	29.89	0.00	30.40	22d.	29.34	11th.
Kodiak ¹	29.89	-0.05	30.34	24th.	29.40	10th.
Midway Island ¹	30.02	-0.05	30.16	14th ¹	29.82	9th.
Honolulu ¹	30.04	0.00	30.13	6th.	29.98	23d.
Juneau ¹	29.97	-0.04	30.40	24th.	29.70	2d.
Tatoosh Island ¹	30.05	+0.03	30.38	23d.	29.62	2d.
San Francisco ¹	29.92	-0.04	30.08	19th.	29.70	12th.
San Diego ¹	29.90	-0.02	30.05	18th.	29.74	27th.

¹ P. m. observations only.

² 29 days.

³ And other dates.

⁴ A. m. and p. m. observations.

⁵ Corrected to 24-hour mean.

In the Hawaiian area the weather was dominated by the Pacific anticyclone to the northward as was the case in the preceding month. At Honolulu the prevailing wind direction was east, this direction being recorded in 602 hours out of 720. The highest velocity was 33 miles (from the east) on the 28th. The average velocity was 10.6 miles an hour. The rainfall at Honolulu continued to be below normal. The total amount for the month was

0.28 inch, or 0.64 below normal. The rainfall here since January 1 totals only 8.53 inches, 6.97 inches below normal.

Few disturbances of importance occurred during the month. The first to be reported was a small one off the Mexican coast, south of the Gulf of Tehuantepec, which was felt on the 3d to 6th by vessels on the California-Panama route. Its cyclonic character and small size are indicated by the reports of the steamships *Margaret Coughlan* and *W. H. Tilford*, which were in close proximity on the morning of the 5th, southward bound. At 5.40 a. m. (L. M. T.) the former was in $14^{\circ} 10' N.$, $94^{\circ} 50' W.$, the latter in $14^{\circ} 15' N.$, $95^{\circ} 00' W.$ At this hour the *Margaret Coughlan* had a north-northeast wind, force 8; barometer, 29.52. The *W. H. Tilford* had a west wind, force 9; barometer, 29.57. Data for this disturbance are too meager to permit of plotting a path or determining the rate of movement. It is evident, however, from the report of a third vessel, the S. S. *Walter A. Luckenbach*, that the center did not move far between the 3d and 5th. This vessel passed over the same route, also southward bound, two days earlier than the vessels previously mentioned and experienced in the same vicinity overcast, squally weather and rough seas. At 4 p. m. of the 3d the barometer had fallen to 29.53, wind east, 7. This was near $13^{\circ} 30' N.$, $94^{\circ} 30' W.$ Later the wind veered to SE., continuing from that direction until the morning of the 4th, when it went to S. and SSW., diminishing to force 3.

From the 7th to 9th vessels in the western part of the ocean experienced moderate to fresh southerly and westerly gales, associated with a depression which was then advancing toward the Aleutians and which contributed to the low pressure already mentioned as obtaining in midocean on the 9th to 11th.

On the 27th to 29th vessels east of Japan experienced moderate to strong gales, which seem to have been occasioned by a disturbance that was over northern Japan on the 27th and 28th, and which moved thence in a north-easterly direction. At 8 p. m. on the 29th the barometer on board the S. S. *President Grant*, in $43^{\circ} 17' N.$, $155^{\circ} 10' E.$, fell to 28.85 inches. The highest force of wind experienced by this vessel was 9 (SW.).

The S. S. *President Pierce* was involved to some extent in this disturbance. Mr. J. B. Zimmerman, third officer and observer, states that it occasioned an unusual sky display on the 27th. The following is taken from his report:

As the sky cleared in the afternoon a magnificent display of clouds came to view. Sky was bright blue to deep blue overhead. Close to the surface raced detached patches of cumulus clouds from NW. to SE. Above them, SSE. to NNW., traveled another set of broken shreds of clouds, and high aloft, slowly converging from NNW. to a point of the horizon bearing SSE. streamed cirrocumulus and cirrus clouds. At sunset the sight was beyond description. A rosy sunset with all the colors imaginable and the most perfect forms of cirrus clouds I have ever seen.

Other gales reported as occurring at various times during the month are recorded in the accompanying table.

DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

"Warm and dry" best characterizes the weather of the month, the important exception being in the Missouri and upper Mississippi valleys and New England where the precipitation was greater than normal. An unusual, for June, hot spell persisted in central and eastern districts during the first 10 days of the month.—A. J. H.

CYCLONES AND ANTICYCLONES

By W. P. DAY

Low-pressure areas were about normal in number. Several of the more important storms developed over the southern Rocky Mountain region or the Southern Slope, although the associated katabatic winds were sometimes first noted on the Pacific coast.

The high-pressure areas were about normal in number, and about equally divided between the so-called Alberta and North Pacific types. The high of the 9th-12th, which brought an end to the warm wave of the first decade, was apparently built up behind the preceding low merely by the inrush of the cooler and hence denser air near the surface in its rear, and on this account was quite shallow as indicated by airplane observations of temperature secured at Washington on the morning of the 11th. There was a decided lapse in temperature up to about 1,200 meters as compared with the preceding day; but above this elevation a strong inversion existed with no change in temperature. It is also interesting to note that this shallow wedge of cold air underrunning warmer air aloft was not accompanied by precipitation within a radius of more than 200 miles of Washington. Thus the real break in the heat wave over a wide territory came with fair weather.

FREE-AIR SUMMARY

By V. E. JAKL

Table 1 shows a well-marked positive departure in temperature at Broken Arrow, Due West, and Groesbeck, and a similarly well marked negative departure at Ellendale. At Broken Arrow, Due West, and Ellendale the departures diminished with altitude, indicating that the contrast in temperature between the northern and the southern stations was, to a larger degree than normal for the month, greater in the lower levels than in the upper. Table 2 shows that at Ellendale the winds up to about 2,000 meters had a northwesterly component instead of the southwesterly directions normal for the month. Otherwise there were no important free-air departures in the various averages for the aerological stations.

The departures in temperature and wind at Ellendale are significant in connection with the unusual amount of precipitation at that station. In order to emphasize the distinguishing feature of the free-air conditions in their bearing on this precipitation comparison will be made with the aerological record at Due West, where the precipitation was distinctly deficient. The comparison supports a conclusion brought out in last month's (May, 1925) free-air summary, viz, that in so far as temperatures within the usually observed range of altitude are concerned high lapse rates are not necessarily the precursors of precipitation; also that when lapse rates equaling the dry adiabatic occur they are by no means always productive of heavy or even measurable amounts of precipitation.

Note should be made of the average lapse rate at Ellendale and Due West in Table 1, where, from 500 meters to 3,500 meters, Due West has a rate of 0.73° , and Ellendale, 0.52° . From individual observations and